

II. AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior listings of claims in the application:

1. (Cancelled) ~~An isolated, soluble, stabilized phycobilisome comprising a plurality of phycobiliproteins specifically connected by at least one linker polypeptide.~~

2-10. (Canceled)

11. (Cancelled) ~~A phycobilisome conjugate comprising a phycobilisome conjugated to a molecular species selected from the group consisting of ligands, receptors, and signal-generating molecules, wherein each phycobilisome comprises a plurality of phycobiliproteins specifically connected by at least one linker polypeptide, said molecular species being attached to a single type of phycobiliprotein, a single type of linker polypeptide, or an anchor protein.~~

12-14. (Canceled)

15. (Cancelled) ~~A phycobilisome conjugate comprising a phycobilisome conjugated to a molecular species selected from the group consisting of ligands, receptors, and signal-generating molecules, wherein each phycobilisome comprises a plurality of phycobiliproteins specifically connected by at least one linker polypeptide, said molecular species being attached to a particular portion of said phycobilisome.~~

16-21. (Canceled)

22. (Cancelled) ~~An isolated phycobilisome comprising a plurality of phycobiliproteins specifically connected by at least one linker polypeptide, said phycobilisome being non-covalently attached to a molecular species selected from the~~

~~group consisting of ligands, receptors, and signal generating molecules, wherein the molecular species is not an antibody which specifically binds said phycobilisome.~~

23-30. (Canceled)

31. (Cancelled) ~~An isolated, functionally intact phycobilisome comprising a plurality of phycobiliproteins specifically connected by at least one linker polypeptide, wherein said phycobilisome is immobilized on a manufactured solid support.~~

32-42. (Canceled)

43. (Cancelled) ~~An input system for a transducer comprising: conversion means for receiving ultraviolet or visible light and directionally transferring light energy of said light; and coupling means for receiving said directionally transferred light energy and delivering said light energy to a transducer.~~

44. (Cancelled) ~~The system of claim 43, wherein said coupling means comprises an optical fiber.~~

45. (Cancelled) ~~The system of claim 43, wherein said coupling means comprises a waveguide.~~

46. (Cancelled) ~~The system of claim 43, wherein said conversion means comprises a phycobilisome.~~

47. (Cancelled) ~~An environmentally responsive optical sensor, comprising: conversion means for receiving ultraviolet or visible light and directionally transferring light energy of said light, wherein transfer of the light energy is dependent on an~~

~~environmental condition; and sensor means for receiving said directionally transferred light energy and producing an indication of the environmental condition.~~

48. (Cancelled) ~~The environmentally responsive optical sensor of claim 47, wherein said directionally transferred light energy comprises a photon of a particular energy level, said energy level being dependent upon said environmental condition.~~

49. (Cancelled) ~~The environmentally responsive optical sensor of claim 47, wherein said conversion means comprises a phycobilisome.~~

50. (Original) A system for processing a light signal comprising:
conversion means for receiving ultraviolet or visible light and directionally transferring light energy of said light and
processing means for receiving and processing said directionally transferred light energy.

51. (Previously Presented) The system of claim 50, wherein said processing means comprises an optical fiber operative to transmit said light signal energy.

52. (Original) The system of claim 50, wherein said processing means comprises a photosensor.

53. (Currently Amended) The system of claim 50, wherein said ~~directionally transferred light energy~~ conversion means comprises a photon conversion means ~~comprises comprising~~ a supramolecular light-absorbing structure.

54. (Cancelled) ~~The system of claim 50, wherein said conversion means comprises a phycobilisome.~~

55. (Cancelled) ~~A method for performing a specific binding assay comprising: contacting a sample comprising an analyte with a specific binding partner; determining the amount of the analyte present in the sample by means of its ability to specifically bind to the specific binding partner, wherein a component of the assay is detectably labeled with a signal generating system comprising phycobilisomes, said phycobilisomes being self-assembling complexes of phycobiliproteins and linker proteins, each phycobilisome comprising at least one rod, said assay component being selected from the group consisting of the specific binding partner, reagent molecules having the same chemical identity as the analyte, and reagent molecules which compete with the analyte for specific binding to the specific binding partner.~~

56-58. (Canceled)

59. (Previously Presented) The system of claim 50, wherein said processing means comprises a waveguide.

60. (Previously Presented) The system of claim 50, wherein said processing means comprises an optoelectronic device.

61. (Currently Amended) A system for processing electromagnetic radiation comprising:

conversion means for receiving electromagnetic radiation and converting said electromagnetic radiation into light energy having a desired property, ~~wherein said conversion means includes a structure comprising a phycobilisome; and~~

processing means for receiving and processing said light energy.

62. (Previously Presented) The system of claim 61, wherein said processing means comprises a phycobilisome.

63. (Previously Presented) The system of claim 61, wherein said processing means comprises an optical fiber.
64. (Previously Presented) The system of claim 61, wherein said processing means comprises a waveguide.
65. (Previously Presented) The system of claim 61, wherein said processing means comprises an optoelectronic device.
66. (Previously Presented) The system of claim 61, wherein said processing means comprises a photosensor.
67. (Previously Presented) An environmentally responsive sensor comprising the system of claim 61.
68. (Previously Presented) The system of claim 61, wherein said electromagnetic radiation comprises ultraviolet or visible light.
69. (Previously Presented) The system of claim 68, wherein said light energy is red-shifted relative to the received electromagnetic radiation.
70. (Previously Presented) The system of claim 61, further comprising a transducer.
71. (Cancelled) ~~A biotransducer comprising:
a transducer, and
a supramolecular light absorbing structure functionally coupled to said transducer, wherein said supramolecular light absorbing structure includes a phycobilisome.~~

72. (Cancelled) ~~The biotransducer of claim 71, wherein said supra-molecular light-absorbing structure is functionally coupled to a molecular species selected from the group consisting of: ligands, receptors and signal-generating molecules.~~

73. (Cancelled) ~~A biotransducer comprising:
a transducer, and
a supramolecular light-absorbing structure functionally coupled to said transducer, wherein said supramolecular light-absorbing structure has an intrinsic structure adapted to receive ultraviolet or visible light and directionally transfer light energy of said light.~~

74. (Cancelled) ~~The biotransducer of claim 73, wherein said supramolecular light-absorbing structure comprises at least one phycobiliprotein-containing rod.~~

75. (New) A system for processing electromagnetic radiation comprising:
conversion means for receiving electromagnetic radiation and converting said electromagnetic radiation into light energy having a desired property, wherein said conversion means includes a structure comprising a phycobilisome, the phycobilisome comprising two or more phycobiliproteins; and
processing means for receiving and processing said light energy.

76. (New) The system of claim 75, wherein the two or more phycobiliproteins are coupled by one or more linker polypeptides.

77. (New) The system of claim 76, wherein the two or more phycobiliproteins are in a particular orientation based on the one or more linker polypeptides.

78. (New) The system of claim 76, wherein the particular orientation facilitates energy transfer between at least two of the two or more phycobiliproteins.

79. (New) A system for processing a light signal comprising:
at least one phycobilisome for receiving ultraviolet or visible light and directionally transferring light energy of said light, wherein the at least one phycobilisome comprises at least one of:

an isolated, soluble, stabilized phycobilisome;
a phycobilisome conjugated to a molecular species selected from the group consisting of ligands, receptors, and signal-generating molecules; and
a phycobilisome immobilized on a manufactured solid support; and
processing means for receiving and processing said directionally transferred light energy.

80. (New) The system of claim 79, wherein the processing means comprises an electronic transducer.

81. (New) The system of claim 80, wherein the electronic transducer comprises an optoelectronic transducer.

82. (New) The system of claim 50, wherein the system comprises a photovoltaic cell.

83. (New) The system of claim 50, wherein the processing means comprises a photovoltaic cell.

84. (New) The system of claim 50, wherein the conversion means comprises phycobiliproteins specifically connected by linker polypeptides.